

U.S. Patent Application Serial No. 09/771,878  
Amendment dated September 22, 2003  
Reply to OA of April 22, 2003

**REMARKS**

Claims 6-17 are pending in this application. Claims 1-5 have been canceled without prejudice and rewritten as new claims 6-17 to more clearly define the present invention, and to exclude a foaming agent from the adhesive layer.

Support for new claims 6-17 appears throughout the specification and claims as originally filed. Specifically, please see pages 7, 8 and 11, of the specification. No new matter has been added.

In view of new claims 6-17 and the remarks set forth below, further and favorable reconsideration is respectfully requested.

*I. At page 2 of the Office Action, claims 1 and 2 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Iwata in view of Airlie and Lee.*

The Examiner states that since Iwata teaches an adhesive containing either SBR and acrylic wherein the adhesive has the same peel strength/temperature properties as recited, and since the particular adhesive system is conventional, the particular conventional adhesive selected would have been nothing more than a routine determination for one of ordinary skill in the art. The Examiner further states that it was conventional to provide adhesives containing both SBR and acrylic, and rosin as a tackifying agent, as evidenced by Airlie and Lee. In view of the following, this rejection is believed to be overcome.

Claims 1-5 have been canceled without prejudice. New claims 6-17 have been written to more clearly set forth the present invention and to exclude a foaming agent from the adhesive layer.

Submitted herewith, please find an English translation of the entire Iwata reference.

Iwata discloses a food container having pressure release holes sealed with an adhesive tape where the adhesive tape includes an adhesive agent layer 14 comprising a thermal separation adhesive comprising a film agent in an amount of from 0.1 to 10 wt %. Please see the translation of Iwata at page 6, paragraph 0019.

In paragraph 0019, at page 6 of Iwata, Iwata discloses that stickiness decreases for the reason "...that the foam agent existing in the adhesive agent layer is foamed under that temperature so that the stickiness is reduced." Thus, Iwata requires a foaming agent in the adhesive composition, in order to achieve reduced adhesiveness when heated.

Both Airlie and Lee are directed to pressure sensitive adhesives where the adhesive is permanent. Neither of these references teach or suggest a loss of adhesive properties caused by a temperature increase. Both references teach that the disclosed adhesive is permanent and exhibits superior pressure sensitivity.

Accordingly, both Airlie and Lee *teach away* from the use of an adhesive in a product where the adhesive weakens upon an increase in temperature.

It is submitted that *prima facie* case of obviousness has not been established because there is no suggestion, incentive, or motivation, supporting the combination of Iwata with Airlie and/or Lee.

Iwata is directed to a food container having pressure release holes sealed with an adhesive tape where the adhesiveness is reduced upon heating, while Airlie and Lee are both directed to

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pressure-sensitive adhesive compositions where the adhesive composition is a permanent adhesive. Both Airlee and Lee require that the adhesive be permanent. Specifically, Airlie teaches at page 2 that the composition forms a "general purpose permanent pressure sensitive adhesive." Thus, Airlie *teaches away* from adhesives which are not permanent.

Further, Airlie teaches that it is desirable to include an anti-foaming agent in the adhesive composition. Please see Airlie at page 2. Thus Airlie *teaches away* from Iwata.

Lee is directed to **carboxylated acrylate styrene butadiene** adhesives having a higher specific adhesion, which are pressure sensitive. Lee teaches that excellent adhesiveness is achieved. Please see the examples and tables of Lee.

Accordingly, the skilled artisan in view of Iwata would have no motivation to look to art directed to permanent adhesives such as Airlie and/or Lee, because Iwata requires an adhesive which loses adhesive properties upon heating and requires a foaming agent to achieve loss of adhesiveness. Likewise, the skilled artisan in view of Airlie or Lee would have no motivation to look to art requiring a non-permanent adhesive and a foaming agent as taught by Iwata, because Airlie and Lee are directed to permanent adhesives.

In conclusion, both Airlie and Lee, each teach away from Iwata.

In view of the above, it is submitted, that the combination of Iwata with either or both of Airlie and Lee is improper, because there is no suggestion, incentive, or motivation supporting the combination. Thus, the Examiner is respectfully requested to withdraw this rejection.

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Assuming *arguendo*, the combination proper, it is submitted that nothing in Iwata, Airlie or Lee, taken alone or together render the claimed invention obvious within the meaning of 35 U.S.C. §103(a).

Iwata requires an adhesive composition including a foaming agent. The foaming agent is required in order to achieve release of the adhesive composition. Again, please see paragraph 0019 of Iwata.

The present claims have been rewritten to exclude a foaming agent. That is, the present claims have been written to recite that the preferred adhesive composition does not include a foaming agent, and to recite the transition language "consisting of" in reference to the adhesive. Please see the present specification, for example, at page 9, paragraph 1.

Iwata does not teach or suggest an adhesive composition absent a foaming agent, as required by the present claims. In fact, Iwata *teaches away* from any adhesive composition not including a foaming agent, since Iwata teaches that a foaming agent is required in order to achieve release of the adhesive upon an increase in temperature.

Airlie and Lee do not cure the deficiencies of Iwata, since Airlie and Lee also teach away from the present adhesive composition. Specifically, both Airlie and Lee teach permanent, pressure-sensitive adhesive compositions. Neither Airlie nor Lee, teach or suggest, the presently claimed adhesive composition where adhesiveness is reduced upon an increase in temperature.

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In view of the foregoing, it is submitted that a *prima facie* case of obviousness has not been established. Further, it is submitted that nothing in Iwata, Airle, or Lee taken alone or together, render the claimed invention obvious within the meaning of 35 U.S.C. §103(a).

According, the Examiner is respectfully requested to withdraw this rejection.

**II.** *At page 3 of the Office Action, claims 3-5 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Iwata, Airle and Lee as applied to claim 1 above, and further in view of Mizuno and Tanno.*

The Examiner states that Mizuno and Tanno disclose the conventionality of centrally located vent holes as well as uneven adhesive widths. The Examiner states that it would obvious to modify Iwata and substitute one conventional structural expedient for another conventional structural expedient, for its art recognized function.

In view of new claims 6-17, and the arguments set forth above, it is submitted that Mizuno and Tanno, taken alone or together, do not cure the deficiencies of Iwata in view of Airle and Lee.

Accordingly, it is submitted that nothing in any of the references cited by the Examiner, taken alone or together, render the claimed invention obvious within the meaning of 35 U.S.C. §103(a).

Thus, the Examiner is respectfully requested to withdraw this rejection.

It is believed that this Amendment is fully responsive to the Office Action dated April 22, 2003.

In view of the new claims, and remarks set forth above, it is submitted that the claims are in condition for allowance, which action is respectfully requested.

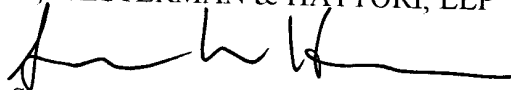
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview in order to expedite the disposition of this case.

Again, attached hereto please find an English translation of the entire Iwata reference.

In the event that this paper is not timely filed, applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: English translation of Iwata



Translation of Iwata reference

**TITLE OF THE INVENTION**

FOOD CONTAINER

**Abstract**

[Object] Providing a food container in which, when heating food in the food container together with the food container with a microwave oven or the like, the food in the food container can be heated or boiled appropriately without any special pre-treatment on the food container and additionally, which is never deformed or destroyed by the internal pressure.

[Construction] A food container 2 for accommodating food inside wherein pressure release holes 8 for communicating between inside and outside is formed in part of a lid 6 of the container 2. The pressure release holes 8 are sealed with an adhesive tape 10 which possesses stickiness when the temperature is less than 80-100° C and whose stickiness drops over that temperature, from outside of the container. The adhesive agent layer 14 of the adhesive tape 10 does not have to be all composed of thermal separation adhesive agent and part of the adhesive agent layer 14 may be composed of thermal non-separation adhesive agent.

## Specification

What is claimed:

[Claim 1] A food container for accommodating food inside wherein pressure release holes, which communicate between inside and outside are formed in part thereof and the pressure release holes are sealed with an adhesive tape possessing stickiness below a predetermined temperature while the stickiness drops over the predetermined temperature from out of the container.

[Claim 2] The food container according to claim 1 further comprising a steaming basket on a bottom thereof.

### DETAILED DESCRIPTION OF THE INVENTION

[0001]

[Technical Field Pertinent to the Invention] The present invention relates to a food container, and more particularly to a food container which when food contained therein is heated by means of a microwave oven or the like, enables the food contained in the same container to be heated or boiled appropriately and further which cannot be deformed or destroyed by an internal pressure.

[0002]

[Prior Art and Problem to be solved by the Invention] In food selling section of a convenience store, super market or department store, food such as Japanese rice lunch has been sold in a condition that it is accommodated in a food container constituted of synthetic resin like polystyrene. The food can be heated together with the food container by means of a microwave oven.

[0003] However, unless there are holes or gaps made in the food container when it is heated with the microwave oven, the food container can be deformed or destroyed due to an internal pressure of the container. Thus, it can be considered to make holes or gaps in the food container preliminarily. However, if the food container has such holes or gaps, such foreign matter as dust or insect can invade through those holes or gaps when it is placed on a store showcase or during transportation. Additionally, liquid from food inside can leak outside through the holes or gaps, which is not sanitary.



[0004] Thus, it can be considered that the food container having the holes or gaps is entirely wrapped with wrapping film or the holes or gaps are partially sealed with bonding tape or adhesive tape. However, in such a case, before the food container is heated with a microwave oven, the wrapping film or tape needs to be removed from the food container and this procedure is worrisome. If that removal procedure is forgotten and the food container is heated with the microwave oven as it is, the food container can be deformed or destroyed due to internal pressure, thereby possibly leading to some trouble.

[0005] An object of the present invention is to provide a food container which when food contained therein is heated together with the same container by means of a microwave oven, enables the food contained in the container to be heated or boiled appropriately without any special pretreatment on the food container and further which cannot be deformed or destroyed by an internal pressure.

[0006]

[Means for solving the problem] To achieve the above-described object, the present invention provides a food container for accommodating food inside wherein pressure release holes for communicating between inside and outside are formed in part thereof and the pressure release holes are sealed with an adhesive tape possessing stickiness below a predetermined temperature while the stickiness drops over the predetermined temperature from outside of the container.

[0007] The food container is comprised of a container main body and a lid body for closing an opening of the food container and preferably, multiple pressure release holes are formed in the lid body. The predetermined temperature in which the stickiness of the adhesive tape is lost is preferred to be 70-100° C.

[0008] The adhesive tape is comprised of a substrate tape and adhesive agent layer formed on the surface of the substrate tape. The adhesive agent layer is formed of thermal separation adhesive agent whose stickiness drops as the temperature rises. As a method for manufacturing such adhesive agent, conventionally, a method of mixing foam resin particles in normal adhesive agent at 0.1-10 weight% has been known. As specific examples of the thermal separation adhesive agent used in the present invention, synthetic rubber base adhesive agents, for example, acrylic

base adhesive agent, natural rubber base, SBR base, NBR base, IR base are exemplified.

[0009] The adhesive agent layer of the adhesive tape does not has to be all formed of thermal separation adhesive agent, and part of the adhesive agent layer may be formed of thermal non-separation adhesive agent.

[0010]

[Operation] Although the food container of the present invention has the pressure release holes, they are sealed with adhesive tape. Thus, there is no fear that foreign matter such as dust, insect may invade through the holes when the food container is placed on a shop showcase or during transportation. Further, there is no fear that liquid component of the food inside may leak outside through the holes.

[0011] If the food in the food container is heated with a microwave oven, that food container is put into the microwave oven without any pre-treatment. If the microwave oven is started, the food in the food container is heated and its temperature is transmitted to the food container. If that heating temperature reaches 70-100° C, according to the present invention, the stickiness of the adhesive tape attached to the food container drops, so that the stickiness is almost lost.

[0012] As a result, the pressure release holes formed in the food container are opened due to application of the internal pressure in the food container as well, so that pressure is released through the holes thereby eliminating a fear that the food container may be deformed or destroyed by the internal pressure of the food container. If part of the adhesive agent layer of the adhesive tape is composed of thermal non-separation adhesive agent, only part of the adhesive tape is separated so as to open the pressure release holes and further, because the other part of the adhesive tape is still attached to the container, the adhesive tape never drops from the container.

[0013] Because in the food container of the present invention, the inside of the food container is completely sealed when the heating temperature is below a predetermined one, an effect of boiling the food in the food container can be expected. Thus, as compared to a case of using a food container with open holes or gaps from the beginning, taste of food after heated with the microwave oven is improved. The reason is that the taste

of rice and the like becomes better when an effect of boiling is added than if the rice is only heated.

[0014] By making the best use of the boiling effect, providing with the steaming basket inside the food container of the present invention makes it possible to sell food which requires boiling processing such as SHUMAI, GYOZA, CHUKA MANNJU, post-steamed hotchpotch and the like in a condition that no marketed steaming basket is required. When a person wishes to eat food in the container, he only has to bring the food container into a microwave oven without any treatment and heat it. Thus, even an aged person or child can eat such food, which requires boiling treatment easily with safety. In this case, it is preferable to fill with water under the steaming basket of the food container depending on the content of cooking before the food container is brought into the microwave oven.

[0015]

[Embodiments] Hereinafter the food container of the present invention will be described with reference to the accompanying drawings. FIG. 1 is a schematic sectional view of the food container according to an embodiment of the present invention. FIG. 2 is a sectional view of major portions of adhesive tape shown in FIG. 1.

[0016] As shown in FIG. 1, the food container 2 of this embodiment comprises a container main body 4 capable of accommodating food inside and a lid body 6 which can be opened or closed freely in order to seal an opening portion in the container main body 4. The container main body 4 and the lid body 6 are constituted of polypropylene, polyethylene, polystyrene, polyethylene terephthalate (PET), or the like.

[0017] If a steaming basket 18 having a number of holes is provided on a bottom of the container main body 4, its boiling effect is further improved. The bottom portion below the steaming basket 18 is capable of accommodating water or the like. Preferably, the lid body 6 has multiple pressure release holes 8. Although the inside diameter of each pressure release hole 8 is not restricted to any particular one, it is preferred to be 2-5 mm. Although the quantity of the pressure release holes 8 is not restricted to any particular number, it is, for example, 2-4.

[0018] These pressure release holes 8 are closed by attaching the adhesive tape 10 on an outer face of the lid body 6. Although the size of the

adhesive tape 10 is not restricted to any particular one, preferably, it has an area about three-six times the opening area of the pressure release hole 8. As shown in FIG. 2, the adhesive tape 10 of this embodiment is comprised of a substrate tape 12 and an adhesive agent layer 14 formed on the surface thereof. Before it is bonded to the lid body 6, as shown in FIG. 2, a separation paper 16 is attached to the surface of the adhesive agent layer 14.

[0019] The substrate tape 12 is not restricted to any particular one and for example, paper, synthetic paper such as polypropylene, polyethylene and polyester film can be used. According to this embodiment, the adhesive agent layer 14 is composed of thermal separation adhesive agent and more specifically, composed of thermal separation adhesive agent containing foam agent of 0.1-10 weight%. The stickiness of the adhesive agent layer 14 constituted of such thermal separation adhesive agent drops remarkably at 70-100° C. For example, if the stickiness under an ambient temperature is 200-400 gr/20 mm, the stickiness becomes 50-0 gr/20 mm at 70-100° C. This reason is that the foam agent existing in the adhesive agent layer is foamed under that temperature so that the stickiness is reduced.

[0020] According to this embodiment, the adhesive tape 10 in which the adhesive agent layer 14 having such special stickiness is formed is attached to the outside of the lid body 6 at a position of the pressure release hole 8. In the food container 2 of this embodiment, the pressure release holes 8 are formed in the food container 2 and those holes 8 are sealed with the adhesive tape 10. Thus, there is no fear that foreign matter such dust or insect may invade through the holes 8 when it is placed on a shop showcase or during transportation. Further, there is no fear that liquid from inside food may leak outside through the holes 8.

[0021] When food in the food container 2 is heated by means of a microwave oven, the food container 2 is carried into the microwave oven without any pretreatment. If the microwave oven is started, food inside the food container 2 is heated and its temperature is transmitted to the food container 2. If the heating temperature reaches 70-100° C, in this embodiment, the stickiness of the adhesive tape 10 attached to the lid body 6 of the food container 2 drops as described previously, thereby substantially eliminating the stickiness.

[0022] As a result, the pressure release holes 8 formed in the food container 2 are opened due to application of the internal pressure in the food container 2 as well, so that pressure is released through the holes thereby eliminating a fear that the food container 2 may be deformed or destroyed by the internal pressure of the food container 2. Because, in the food container 2 of this embodiment, the inside of the food container 2 is sealed completely when the heating temperature is under a predetermined one, an effect of boiling the food in the food container 2 can be expected. Therefore, as compared to a case of using a food container 2 with open holes or gaps from the beginning, taste of food after heated with the microwave oven is improved. The reason is that the taste of rice and the like becomes better when an effect of boiling is added than if the rice is only heated.

[0023] By making the best use of the boiling effect, providing with the steaming basket inside the food container 2 further improves the boiling effect and consequently, food which requires boiling processing such as SHUMAI, GYOZA, CHUKAMANJU, post-steamed hotchpotch can be accommodated for selling. When a person wishes to eat food in the container, he only has to bring the food container 2 into a microwave oven without any treatment and heat it. Thus, even an aged person or child can eat such food, which requires boiling treatment easily with safety. In this case, it is preferable to fill with water under the steaming basket of the food container 2 depending on the content of cooking before the food container 2 is brought into the microwave oven.

[0024] Meanwhile, the present invention is not restricted to the above-described embodiments and may be modified in various ways. For example, the adhesive agent layer 14 does not have to be all composed of thermal separation adhesive agent but part of the adhesive agent layer may be composed of thermal non-separation adhesive agent.

[0025] In that case, when a food container 2 containing food is heated within a microwave oven, only part of the adhesive tape 10 is separated so as to open the pressure release hole 8 while the other part of the adhesive tape 10 is still attached to the container. Consequently, the adhesive tape 10 never drops from the container. As the thermal non-separation adhesive agent, any ordinary pressure-sensitive adhesive agent may be used and for example, rubber base adhesive agent, acrylic base adhesive agent and the like may be selected.

[0026] Next, the present invention will be described with specific examples. The present invention is not restricted to these examples.

Example 1

A food container 2 was formed by combining a container main body 4 made of polypropylene, 250 mm vertically, 180 mm horizontally, 30 mm high, 0.45 mm thick with a lid body 6 made of polyethylene, 250 mm vertically, 180 mm horizontally, 12 mm high, 0.2 mm thick. Two pressure release holes 8 having a diameter of 5 mm were formed at an interval of 50 mm in the lid body 6. These pressure release holes 8 were sealed with an adhesive tape 10, 30 mm x 40 mm in size from outside of the lid body 6. As for the adhesive tape, adhesive tape made by NITTO DENKO Corporation having a product serial NO. 3195 was used as an adhesive tape having thermal separation adhesive layer whose stickiness drops remarkably at temperatures of 80° or more.

[0027] Rice and SHUMAI of 300 gr in weight were accommodated in that food container and heated with a microwave oven for three minutes. As a result, it was confirmed that all the adhesive tapes 10 were separated from the lid body 6 and the internal pressure was released. The rice and SHUMAI were heated and boiled appropriately and provided excellent taste.

[0028] Comparative example 1

Except that no pressure release hole 8 was formed in the lid body 6 and no adhesive tape 10 was used, the food container was formed in the same way as the example 1 and heated with a microwave oven in the same way as the example 1.

[0029] It was confirmed that the container was deformed by an internal pressure.

Comparative example 2

The pressure release hole 8 was formed in the lid body 6 and except that no adhesive tape 10 was used, the food container was formed in the same way as the example 1 and heated with a microwave oven in the same way as the example 1.

[0030] Although the container was not deformed by an internal pressure, there was found no effect of boiling food and the taste dropped as compared to the example 1. Additionally, a leakage occurred from the content.

[0031]

[Effect of the Invention] As described above, although the food container of the present invention has the pressure release holes, the holes are sealed with the adhesive tape. Thus, there is no fear that dust or insect may invade through the holes when the food is placed on a shop showcase or during transportation. Further, there is no fear that liquid component of food inside may leak outside through the holes. That is, the food container of the present invention is sanitary.

[0032] When food inside the food container of the present invention is heated together with the food container with a microwave oven, the food inside the food container can be heated or boiled appropriately without any special pre-treatment on the food container. Additionally, the food container is never deformed or destroyed by the internal pressure. Thus, even an aged person or child can handle easily with the safety.

[0033] When the food container of the present invention is heated within the microwave oven, the food inside the food container is boiled. Thus, the food taste is improved. Therefore, it is possible to accommodate food whose taste is improved by boiling in the food container of the present invention, for selling in convenience store, super market, department store food section, Chinese food retailer and the like.

[Brief Description of the Drawings]

[FIG. 1] FIG. 1 is a schematic sectional view of a food container according to an embodiment of the present invention.

[FIG. 2] FIG. 2 is a sectional view of major portions of the adhesive tape shown in FIG. 1.

[Description of Reference Numerals]

- 2: food container
- 4: container main body
- 6: lid body
- 8: pressure release hole
- 10: adhesive tape
- 12: substrate tape
- 14: adhesive agent layer

FIG. 1

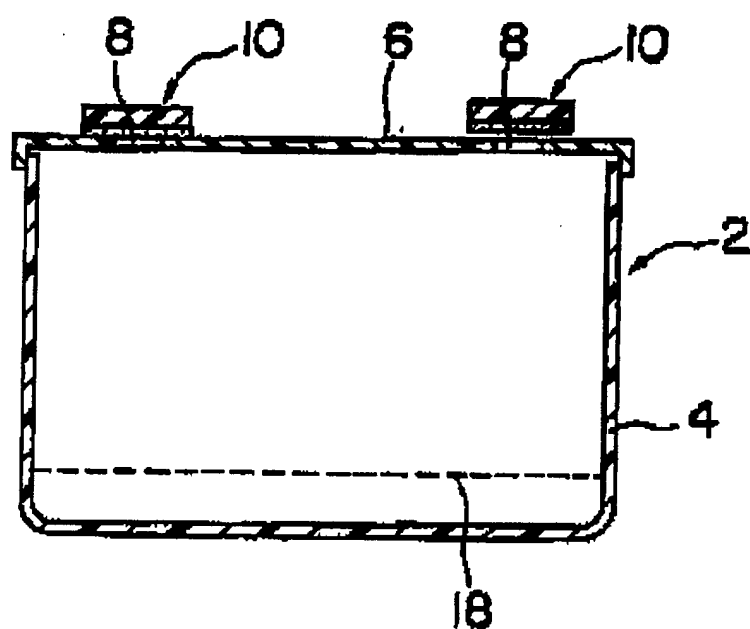


FIG. 2

